

The First Þingvellir Conference

Re:Connecting the Sun and Planets

Target date: February 2007

Statement of Purpose:

The interaction of stellar winds with planetary atmospheres is among the most fundamental and ubiquitous of space plasma processes. Planetary formation continues after ignition of a protostar, with a competition between accretion by gravity and ablation of volatile material and dust by the stellar furnace with its photon, particle and plasma flow fields. Earth exists in a long period of stability during which the fluxes to and from space are small and in rough balance, so that they appear irrelevant compared with the nearly closed chemistry of solid earth, ocean, and atmosphere. However, our studies of Mars have shown that loss of volatiles to space can transform a planet when fluxes are sufficiently large. This may be correspondingly more important, perhaps even definitive, during the early phase when stellar wind mass flux is much larger, and interplanetary space is being voided through the combined action of accretion and ablation. A full understanding of this has apparent implications for the composition of atmospheres and oceans as a function of radial distance in generalized stellar-planetary systems. A complicating factor is the highly variable occurrence of planetary magnetic dynamos. These lead to a spectrum of different magnetic interactions, even for a single planet, which may undergo magnetization collapse and reversal as its bistable dynamo vacillates in sign, like that of our own Earth (and Sun).

The overarching goal of this conference will be to gather and consolidate our current understanding of connections between stellar and planetary atmospheres. Papers are solicited on all aspects of stellar-planetary connections, for all bodies from unmagnetized comets to magnetized gas giants, and including types not found in our solar system, since some extra-solar planets have spectral signatures of escaping atmospheres. Space observations from operating or recent space missions are particularly solicited, especially in comparison with relevant models. A major objective of the conference will be the identification of essential ingredients for a successful general model of stellar-planetary connections. An interdisciplinary approach merging solar physics, atmospheric aeronomy, magnetospheric physics and magnetic dynamo physics must be brought to bear on this problem to foster a path toward full understanding of stellar-planetary relations.

We seek to facilitate interactions among European and American scientists, and provide opportunities for impromptu observations of the polar aurora, through our choice of venue at high latitude in mid-Atlantic Ocean, near Þingvellir (or Thingvellir) in Iceland. In 930 AD, while most of Europe was mired in feudalism and conflict, chieftains in Iceland gathered in a natural amphitheater to the north and west of

Reykjavik and formed the world's first parliament, the Althing. The meeting place was named Þingvellir ("parliament plains"), and over the next 300 years, representatives journeyed here once a year to elect leaders, argue cases, and settle disputes - sometimes peacefully, sometimes not. The founders of the Althing could hardly have chosen a more fascinating place to meet. Þingvellir tells the story of both Iceland and its people. Few places in the world possess a landscape that better depicts the geologic history of our planet. In Þingvellir, you can stand on a bluff and see the Mid-Atlantic ridge as it carves its way North and East through the island's interior, laying bare our planet's geomagnetic history through tectonic upwelling and volcanic activity, as the Aurora plays overhead. Iceland is truly a land of Fire and Ice, emblematic of the planet-forging interplay between stellar furnaces and icy planetesimals, making it an outstanding choice for a conference on this topic.

Organizing Committee: T E Moore, chair, J L Horwitz, co-chair, R Greenwald, co-chair
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land of fire & ice



SOME say the world will end in fire,
Some say in ice.
From what I've tasted of desire
I hold with those who favor fire.
But if I had to perish twice,
I think I know enough of hate
To know that for destruction ice
Is also great
And would suffice.
-- Robert Frost

Aurora

by Bjørk

Treading
The glacier head
Looking hard for
Moments of shine
From twilight
To twilight
Ahhhhh...
Utter mundane

Aurora
Goddess sparkle
Shoot me
Beyond this suffer
The need
Is great
Aurora
Ahhhh...
Utter mundane

Aurora
Goddess sparkle
A mountain shade
Suggests your shape
I tumbled down
On my knees
Fill the mouth
With snow
The way it melts
I wish
To melt
Into you
Aurora
Ahhh...
Utter mundane

Spark the sun off
Spark the sun off
Spark the sun off
Spark the sun off me